Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-25 (Cancelled)

26. (New) A production method for an organic-silica complex membrane having a sulfonic acid group, comprising:

obtaining a sulfonic acid derivative by allowing an alkoxysilane compound having an amino group to react with a cyclic sultone; and

subjecting the sulfonic acid derivative to a condensation reaction.

27. (New) A production method for an organic-silica complex membrane having a sulfonic acid group, comprising:

obtaining a sulfonic acid derivative by allowing a secondary or tertiary amine derivative which is obtained by allowing an alkoxysilane compound having an amino group to react with a compound having at least 2 epoxy groups in a molecule to react with a cyclic sultone; and

subjecting the sulfonic acid derivative to a condensation reaction.

28. (New) A production method for an organic-silica complex membrane having a sulfonic acid group, comprising:

obtaining a sulfonic acid derivative by allowing a secondary or tertiary amine derivative which is obtained by allowing an alkoxysilane compound having an epoxy group to react with an amine compound having at least 2 amine valences (number of hydrogen atoms originated in an amino group contained in one molecule) to react with a cyclic sultone; and

subjecting the sulfonic acid derivative to a condensation reaction.

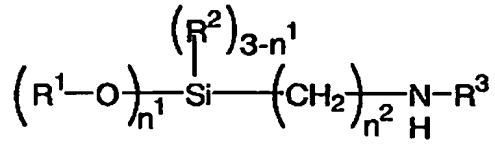
29. (New) A production method for an organic-silica complex membrane having a sulfonic acid group, comprising:

obtaining a sulfonic acid derivative by allowing a secondary or tertiary amine derivative which is obtained by allowing an alkoxysilane compound having an amino group to react with an alkoxysilane compound having an epoxy group to react with a cyclic sultone; and

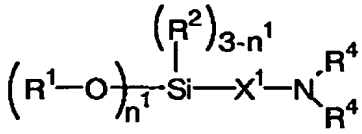
subjecting the sulfonic acid derivative to a condensation reaction.

30. (New) The production method as set forth in Claim 26, wherein the alkoxysilane compound having an amino

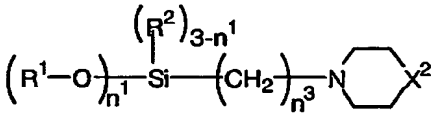
group is selected from the group consisting of compounds of formulae (1) to (5):



(1);



(2);



(3);

(4); and

(5),

wherein R^1 represents a methyl group or an ethyl group;

R^2 represents a hydrogen atom, a methyl group or an ethyl group;

R^3 represents a hydrogen atom, a methyl group, an ethyl group, an allyl group, a phenyl group or an organic group represented by the following general formula (6);

R^4 represents a methyl group, an ethyl group or a hydroxyethyl group;

R^5 represents a 3-(N-phenylamino)propyl group, a 3-(4,5-dihydroimidazolyl)propyl group or a 2-[N-(2-aminoethyl)aminomethyl phenyl]ethyl group;

X^1 represents a divalent alkylene having from 1 to 6 carbon atoms;

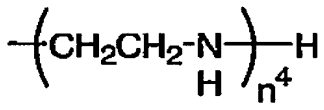
X^2 represents methylene which is a divalent organic group, oxygen or a secondary amine;

X^3 represents a divalent organic group represented by -NH- or $-NHCH_2CH_2NH-$;

n^1 represents an integer of from 1 to 3;

n^2 represents an integer of from 1 to 6; and

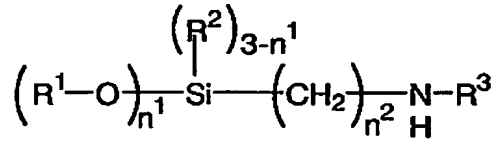
n^3 represents an integer of from 1 to 3:



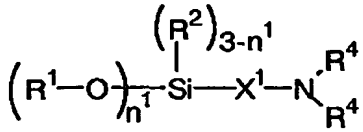
(6),

wherein n^4 represents an integer of from 0 to 2.

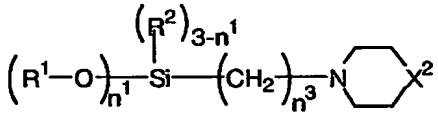
31. (New) The production method as set forth in Claim 27, wherein the alkoxysilane compound having an amino group is selected from the group consisting of compounds of formulae (1) to (5):



(1);

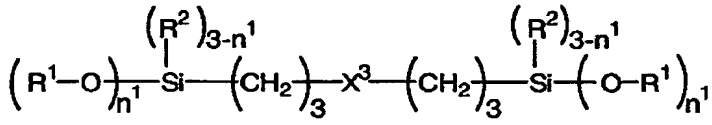


(2);



(3);

$(R^1\text{-}O)_3\text{-}Si\text{-}R^5$ (4); and



(5),

wherein R^1 represents a methyl group or an ethyl group;

R^2 represents a hydrogen atom, a methyl group or an ethyl group;

R^3 represents a hydrogen atom, a methyl group, an ethyl group, an allyl group, a phenyl group or an organic group represented by the following general formula (6);

R^4 represents a methyl group, an ethyl group or a hydroxyethyl group;

R^5 represents a 3-(N-phenylamino)propyl group, a 3-(4,5-dihydroimidazolyl)propyl group or a 2-[N-(2-aminoethyl)aminomethyl phenyl]ethyl group;

X^1 represents a divalent alkylene having from 1 to 6 carbon atoms;

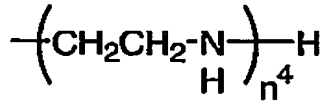
X^2 represents methylene which is a divalent organic group, oxygen or a secondary amine;

X^3 represents a divalent organic group represented by -NH- or $-NHCH_2CH_2NH-$;

n^1 represents an integer of from 1 to 3;

n^2 represents an integer of from 1 to 6; and

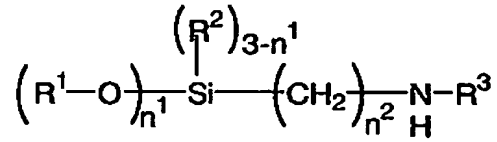
n^3 represents an integer of from 1 to 3:



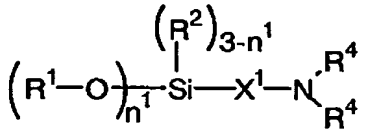
(6),

wherein n^4 represents an integer of from 0 to 2.

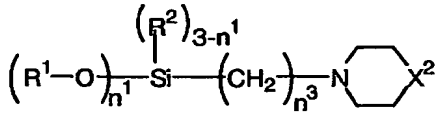
32. (New) The production method as set forth in Claim 29, wherein the alkoxysilane compound having an amino group is selected from the group consisting of compounds of formulae (1) to (5):



(1);

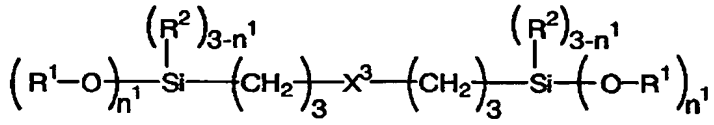


(2);



(3);

$(R^1\text{-}O)_3\text{-}Si\text{-}R^5$ (4); and



(5),

wherein R^1 represents a methyl group or an ethyl group;

R^2 represents a hydrogen atom, a methyl group or an ethyl group;

R^3 represents a hydrogen atom, a methyl group, an ethyl group, an allyl group, a phenyl group or an organic group represented by the following general formula (6);

R^4 represents a methyl group, an ethyl group or a hydroxyethyl group;

R^5 represents a 3-(N-phenylamino)propyl group, a 3-(4,5-dihydroimidazolyl)propyl group or a 2-[N-(2-aminoethyl)aminomethyl phenyl]ethyl group;

X^1 represents a divalent alkylene having from 1 to 6 carbon atoms;

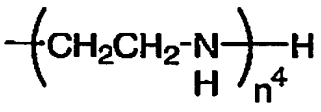
X^2 represents methylene which is a divalent organic group, oxygen or a secondary amine;

X^3 represents a divalent organic group represented by -NH- or $-NHCH_2CH_2NH-$;

n^1 represents an integer of from 1 to 3;

n^2 represents an integer of from 1 to 6; and

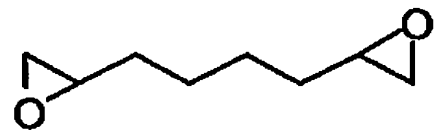
n^3 represents an integer of from 1 to 3:



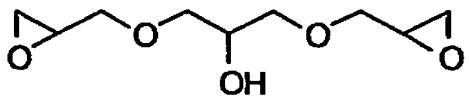
(6),

wherein n^4 represents an integer of from 0 to 2.

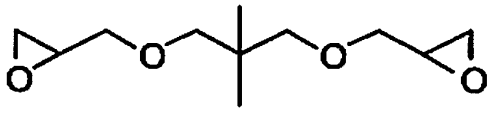
33. (New) The production method as set forth in Claim 27, wherein the compound having at least 2 epoxy groups in a molecule is selected from the group consisting of compounds of formulae (7) to (28):



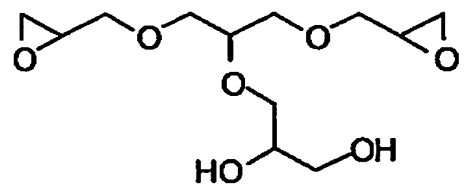
(7);



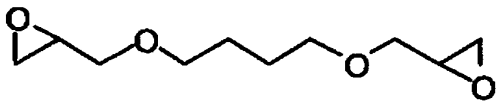
(8);



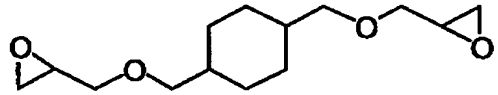
(9);



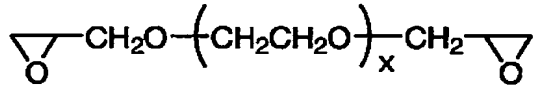
(10);



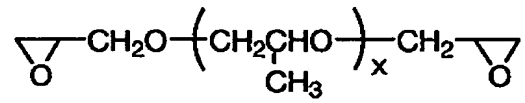
(11);



(12);

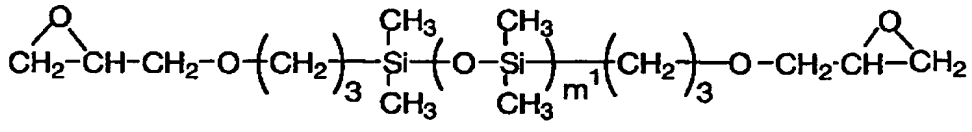


(13);



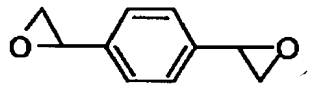
(14),

wherein x represents an integer of from 1 to 1000;

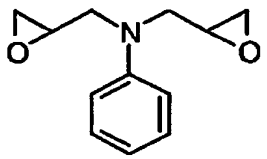


(15),

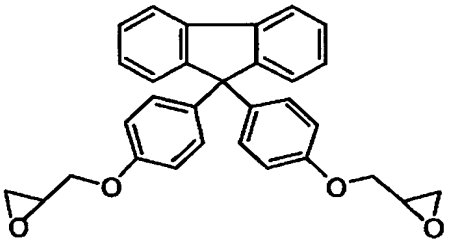
wherein m^1 represents an integer of from 1 to 100;



(16);

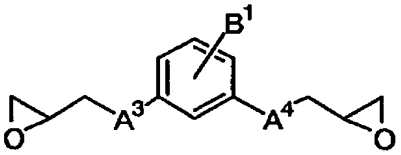


(17);



(18);

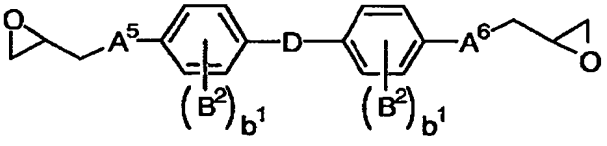
(19);



(20),

wherein A^1, A^2, A^3 and A^4 each independently represents a divalent linking group selected from among -O-, -C(=O)O-, -NHC(=O)O- and -OC(=O)O-; and

B^1 represents any one of substituents: -H, $-CH_3$ and $-OCH_3$;



(21),

wherein A^5 and A^6 each independently represent a divalent linking group selected from among -O-, -C(=O)O-, -NHC(=O)O- and -OC(=O)O- ;

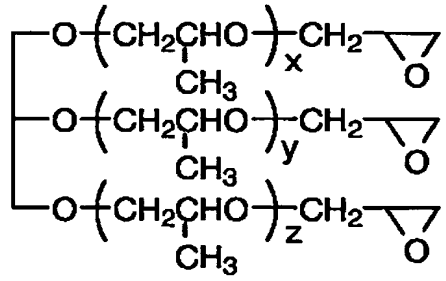
B^2 represents any one of substituents: -H, $-CH_3$ and $-OCH_3$;

b^1 represents an integer of from 0 to 4;

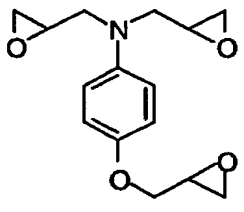
D represents a single bond or any one of divalent linking groups: -O-, -C(=O)-, -C(=O)O-, -NHC(=O)-, -NH-, -N=N-, -CH=N-, -CH=CH-, -C(CN)=N-, -C≡C-, $-CH_2-$, $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-C(CH_3)_2-$ and the general formulae: $-O-(CH_2)_m-O-$ and $-O-(CH_2CH_2O)_n-$,

wherein m represents an integer of from 2 to 12; and

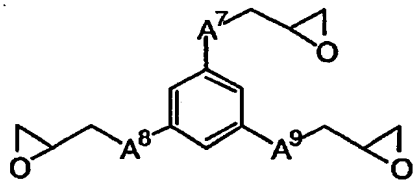
n represents an integer of from 1 to 5;



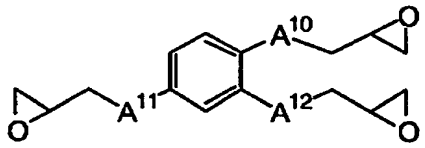
(22);



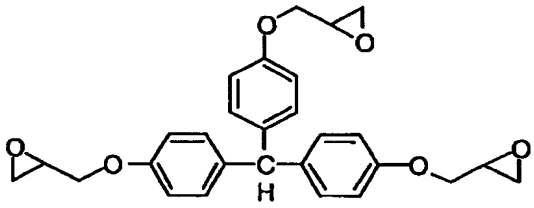
(23);



(24);



(25);

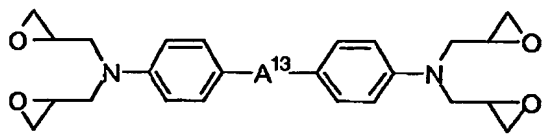


(26),

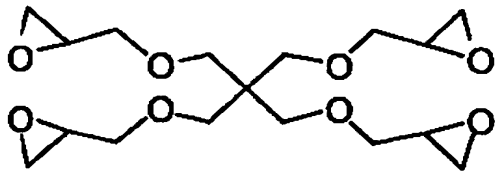
wherein x, y and z each independently represent an integer of from 1 to 20;

A^7, A^8 and A^9 each independently represents a divalent linking group selected from among -O-, -C(=O)O-, -NHC(=O)O-, and -OC(=O)O-; and

A^{10}, A^{11} and A^{12} each independently represents a divalent linking group selected from among -O-, -C(=O)O-, -NHC(=O)O- and -OC(=O)O-;

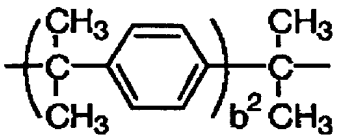


(27); and

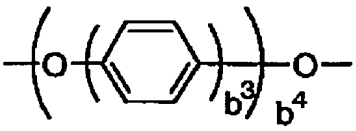


(28),

wherein A^{13} represents methylene or a linking group represented by any one of the following general formulae (29) and (30):



(29); and



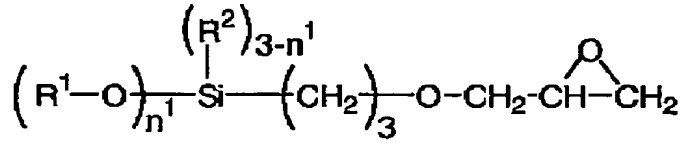
(30),

wherein b^2 represents an integer of from 0 to 4;

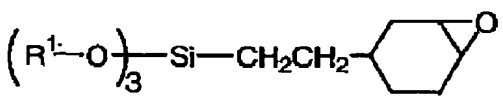
b^3 represents an integer of from 1 to 3; and

b^4 represents an integer of from 0 to 2.

34. (New) The production method as set forth in Claim 28, wherein the alkoxysilane compound having an epoxy group is a compound of formula (31) or (32):



(31); or

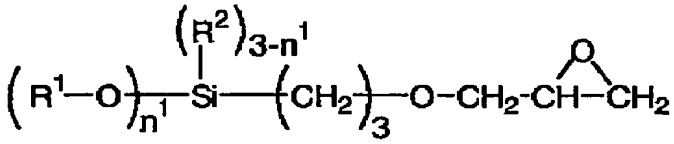


(32),

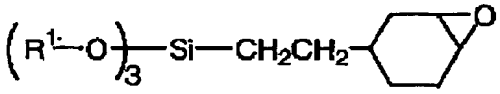
wherein R^1 and R^2 each independently represents a methyl group or an ethyl group; and

n^1 represents an integer of from 1 to 3.

35. (New) The production method as set forth in Claim 29, wherein the alkoxysilane compound having an epoxy group is a compound of formula (31) or (32):



(31); or

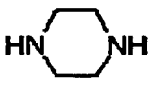


(32),

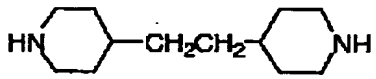
wherein R^1 and R^2 each independently represents a methyl group or an ethyl group; and

n^1 represents an integer of from 1 to 3.

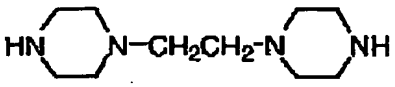
36. (New) The production method as set forth in Claim 28, wherein the amine compound having at least 2 amine valences is selected from the group consisting of compounds of formulae (33) to (51):



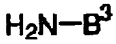
(33);



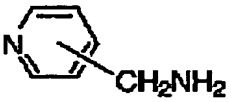
(34);



(35);

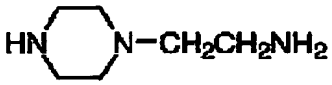


(36);

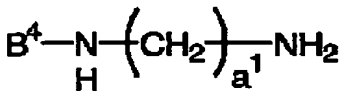


(37),

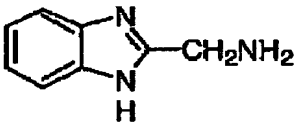
wherein B^3 represents a hydrocarbon group having from 2 to 18 carbon atoms or a group having at least one ether bond in a hydrocarbon chain;



(38);



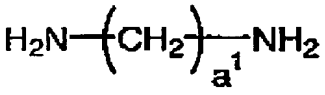
(39);



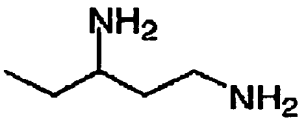
(40),

wherein a^1 represents an integer of from 2 to 18;

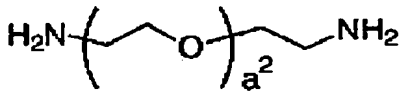
B^4 represents a hydrocarbon group having from 1 to 18 carbon atoms or a group having at least one ether bond in a hydrocarbon chain;



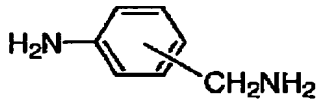
(41);



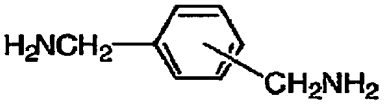
(42);



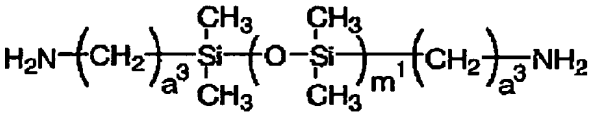
(43);



(44);



(45);



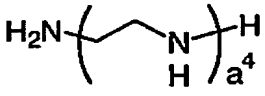
(46),

wherein a^1 represents an integer of from 2 to 18;

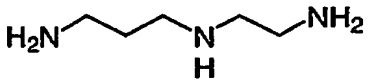
a^2 represents an integer of from 1 to 10000;

m^1 represents an integer of from 1 to 100; and

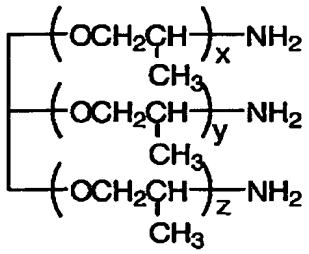
a^3 represents an integer of from 3 to 18;



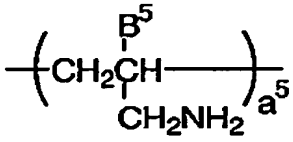
(47);



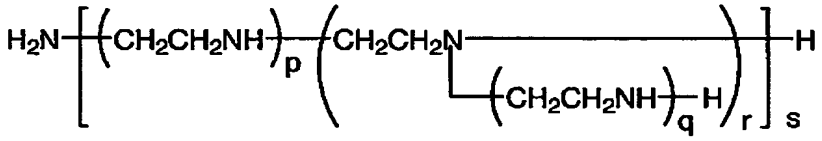
(48);



(49);



(50); and



(51),

wherein a^4 represents an integer of from 2 to 100;

x, y and z each independently represents an integer of from 1 to 20;

a^5 represents an integer of from 2 to 1000;

B^5 represents hydrogen or a methyl group; and

p, q, r and s each independently represents an integer of from 1 to 20.